Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Murphy Oil U.S.A, Inc.
Meraux Refinery
Meraux, St. Bernard Parish, Louisiana
Agency Interest Number: 1238
Activity Number: PER20050006
Proposed Permits 2500-00001-V2

I. *APPLICANT:*

Company:
Murphy Oil U.S.A, Inc.
Meraux Refinery
2500 E. St. Bernard Highway
Meraux, Louisiana 70075

Facility:
Murphy Oil U.S.A, Inc. – Meraux Refinery
2500 E. St. Bernard Highway, Meraux, St. Bernard Parish, Louisiana
Approximate Latitude 29 degrees, 55 minutes, and 51 seconds
Longitude 89 degrees, 56 minutes, and 27 seconds
Zone 15

Responsible Official:
Mr. Ernie Cagle, Refinery Manager

II. *FACILITY AND CURRENT PERMIT STATUS*

Murphy Oil produces propane, motor gasoline, kerosene, diesel, No. 6 fuel oil, and other miscellaneous petroleum products. The refinery consists of Crude Distillation Unit, Vacuum Distillation Unit, Rose Unit, Hydrofluoric Acid Alkylation Unit, Hydrobon Unit, Platformer Unit, Amine Unit, Sulfur Recovery Units, Distillate Hydrotreating Unit, C3/C4 Splitter Unit, Middle Distillate Hydrotreating Unit, Merox Process, Sour Water Stripper Process, Liquid Petroleum Gas Recovery Unit, Fluid Catalytic Cracking Units, Wastewater Treatment System, and Steam Generation Unit.

The initial petroleum refining process separates crude oil into different fractions based upon its boiling point ranges. Light hydrocarbon fractions may undergo catalytic reforming to rearrange short chain hydrocarbon streams for use in gasoline blending. Heavier fractions may undergo catalytic cracking to break up the large hydrocarbon compounds into useful gasoline blending components. Various process streams are also treated to remove sulfur before further processing takes place. Petroleum refinery operations typically include auxiliary systems such as hydrogen production, wastewater treating, and steam production. For a detailed explanation of the processes see the proposed permit.

Murphy Oil was issued a Part 70 Operating Permit No. 2500-00001-V0 dated April 17, 2001 to expand it's operations as part of a "Clean Fuels" project. Part 70 Operating Permit No. 2500-00001-V1 dated February 8, 2002 allowed MOU to add a "No. 3 Sulfur Unit"

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as part of the "Clean Fuels" project to produce low sulfur gasoline with sulfur content less than 30 parts per million (ppm). This project was undertaken based on the promulgated final rule titled "Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emission Standards and Gasoline Sulfur Control Requirements" (Tier 2 rule). This rule requires a reduction in sulfur content in gasoline.

MOU is updating the "Clean Fuels" project to include the production of Ultra Low Sulfur Gasoline which allowed the construction and operation of the "No. 3 Sulfur Unit" (Phase I) and further proposes another modification to the facility to include the production of Ultra Low Sulfur Diesel (Phase II) at the facility. This project is being undertaken on the promulgated final rule titled "Control of Air Pollution from New Motor Vehicles: Heavy Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements" (Heavy Duty Engine and Highway Diesel Fuel Rule) on January 18, 2001.

Clean Fuels (Phase I) Project: The Phase I project was approved under Part 70 Operating Permit No. 2500-0001-V0 and V1. The project netted out of a Prevention of Significant Deterioration (PSD) review. The following description provides the updated Phase I project and changes to the project:

Hydrocracker: The new hydrocracker and the cooling tower construction were completed in March 2004 and the units are operating. The full fledged operation of the hydrocracker resulted in a reduction in emissions from permitted limits for SO_2 and NO_X from the FCC No. 2.

Sour Water Stripper/Oily Water Stripper/Sulfur Recovery Unit: The new No. 2 Sour Water Stripper and SRU No. 3 construction is complete. The SRU No. 1 Unit (40 long tons per year) will be removed and its oxygen enrichment equipment will be utilized by SRU No. 2 (80 long tons per year). This modification will increase the capacity of SRU No. 2 from 80 to 120 long tons per day with no change in emissions due to the addition of oxygen and not air. A new SRU No. 4 identical to SRU No. 3 will be installed and the emissions will be permitted under a cap (SRU No. 2, 3, and 4). The overall emissions cap will be lower than the present permitted emissions.

Crude Unit: The crude unit expansion is complete and is operational.

Hydrobon Unit: The hydrobon unit expansion is complete and operational. The emissions from this unit will be updated based on the stack test.

Platformer Unit: The platformer unit expansion is complete and operational. The average heat input was updated to be 150 MM BTU/hr. The NSR analysis will be updated appropriately.

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ROSE Unit: The ROSE unit expansion is complete and operational. This unit will have a new asphaltene tank and the emissions will be routed to a new control device.

FCC No. 2: The FCC No. 2 revamp is complete and operational. The potential to emit SO_2 and NO_X emissions will be lowered to reflect the "Clean Fuels" operation based on the utilization of low sulfur and low nitrogen feed.

Boilers: The boiler construction is complete and operational. The average and maximum heat input from two boilers were updated to 125 MM BTU/hr and 250 MM BTU/hr, respectively.

Flash Drum Vent Gas Compression: The flash drum vent gas compression construction is complete and operational.

Tank Reductions: As part of the "Clean Fuels" project two more tanks were taken out of service. Due to reduction of tankage at the refinery the tank service was updated to achieve operational flexibility (See TABLE A)

Boiler and Heaters Cap: The boilers and heaters cap was updated to reflect the stack test results and AP-42 emission factor changes.

The updated "Clean Fuels" Phase I project (initial expansion, SRU No. 3 and 4, and other changes) results in a significant increase in emissions of regulated pollutants. Estimated emission increases due to the "Clean Fuels" Phase I and Phase I updated (all modifications combined) projects based on actual to potential in tons per year are shown in the following table:

Pollutant	Project Increases	PSD De Minimis	Netting Required
PM_{10}	58.75	15	Yes
SO_2	279.95	40	Yes
NO_X	371.88	40	Yes
CO	1221.82	100	Yes
VOC	214.40	40	Yes

An updated PSD review is required for the "Clean Fuels" Phase I and Phase I updated modifications. Estimated emissions increases due to these projects are significant. Therefore, PSD review (netting) is required. The actual emissions are based on the average of years 1997 and 1998 and the contemporaneous period is from January 1, 1996 to March 1, 2003. The netting analysis is shown in the following table:

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Pollutant	Actual Emissions	Post Emissions	Increase due to Projects	Contemporaneous Change *	Net Change
PM_{10}	139.02	197.76	58.74	- 106.66	- 47.92
SO_2	262.65	542.59	279.94	- 941.88	- 661.94
NO_X	672.29	1044.17	371.88	- 563.83	- 191.95
CO	632.65	1854.47	1221.82	- 15631.67	- 14409.85
VOC	386.46	600.86	214.40	- 366.74	- 152.34

* Contemporaneous changes includes removal of boilers, compressors, tanks, FCCU No. 1, and FCCU preheater (Permit Nos. 2378, 2548, 2560, 2500-00001-06) and changes to the Part 70 Operating Permit No. 2500-00001-V1

The net changes in emissions indicate that PSD review is not required.

"Clean Fuels" Phase II Project: Earlier it was anticipated that the Ultra Low Sulfur Diesel will have a specification of 50 ppm sulfur concentration. The final regulation requires a concentration of 15 ppm. Due to inflexible implementation regulations, pipeline specifications typically require a sulfur concentration of below 10 ppm. In order to comply with this requirement and streamline the facility operations MOU will expand the FCC unit, revamp the distillate and middle distillate hydrotreaters (DHT and MDH) unit, and add new tanks and cooling tower complex. Other minor modification will be to reduce the vacuum vent gas emissions by routing them to the fuel gas system. MOU will permanently shutdown two boilers due to hurricane damage and build one new boiler.

FCC Revamp: MOU will revamp the FCC by controlling the excess flue gas oxygen in the regenerator. In order to achieve this goal MOU will improve catalyst circulation (slide valve changes), incorporate blower controls, improve air distribution and removal of the FCC catalyst cooler. There will not be any change in the coke burn rate due these modifications. These changes will result in more efficient combustion of coke allow the regenerator to operate at lower excess oxygen.

LPG Caustic Treating: Currently the saturated butane stream from the crude unit is mixed with the unsaturated propylene/butylene stream from the FCC and treated in the Merox Unit for the removal of sulfur streams. MOU proposes to remove the saturated butane stream from the existing Merox Unit and rout it to a new caustic treater which will be located in the Naphthfiner Unit.

MDH Revamp: MOU will revamp the existing middle distillate hydrotreating unit in order to produce ultra low sulfur diesel. The capacity of the MDH unit will increase to 40,000 barrels per day from 32,000 barrels per day. The project includes replacement of the existing charge pumps with higher capacity and a new header, eight additional pumps,

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and a new recycle gas amine absorber. There will not be any increase in the firing rates of the charge heater or fractionator heater. The project is expected to increase the production of elemental sulfur by approximately 2.5 long tons per day.

DHT Revamp: The purpose of this revamp is to produce ultra low sulfur diesel. The project includes replacement of heater tubes with a more corrosion resistant metallurgy, larger pumps, five additional pumps, addition of heat exchangers, a recycle gas amine absorber, replacement of two existing recycle/makeup compressors with large electrically driven compressors. There will not be any increase in the firing rate of the heater. The project is expected to increase the production of elemental sulfur by approximately 3.5 long tons per day.

Tankage Addition: MOU will install four new 250,000 barrel storage tanks to operate in middle distillate service and will be included in the middle distillate CAP. The facility will incorporate the tanks constructed and modified under the Part 70 General Permit No. 3046-V0 dated November 9, 2006.

Vent Gas Reduction: MOU will route the Vacuum and the Oily Water Stripper vents to the Fuel Gas System (FGS). In addition, MDH Product Fractionator receiver and ROSE Unit solvent surge drum vents to the FGS.

Boilers: A new boiler equipped with low NOx burners will be installed to replace the two damaged boilers due to hurricane.

Estimated emission increases due to the "Clean Fuels" Phase II project based on actual to potential in tons per year are shown in the following table:

Pollutant	Project Increases	PSD De Minimis	Netting Required
PM_{10}	6.48	15	No
SO_2	27.50	40	No
NO_X	40.72	40	Yes
CO	68.34	100	No
VOC	21.67	40	No

PSD review is required for the "Clean Fuels" Phase II project. Estimated NOx emissions increase due to these projects is significant. Therefore, PSD review (netting) is required. The actual emissions are based on the average of years 2001 and 2002 and the contemporaneous period is from January 1, 2001 to December 31, 2008 (the ROSE unit was not operating in 2003 thru 2005 due to a fire).The netting analysis is shown in the following table:

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Pollutant	Actual Emissions	Post Emissions	Increase due to Projects	Contemporaneous Change *	Net Change
NO_X	63.84	104.56	40.72	- 424.64	- 383.92

* Contemporaneous changes include the changes due the update of the Phase I project and other changes since.

The net changes in emissions indicate that PSD review is not required.

Along with the "Clean Fuels" updated Phase I and the Phase II project MOU proposes to reconcile the following:

1) Update the tank storage based on operational flexibility;
2) Update fugitive emissions based on current component count and operations;
3) Reroute the Merox Off-Gas Knockout Pot stream from the No. 2 Alky Reboiler to the FCC Regenerator;
4) Reroute the hotwell vent gas stream from Vacuum Heaters East/West to the fuel gas system;
5) Incorporate a specific condition in order to have flexibility to add or remove fugitive emission piping and components;
6) Add a new asphaltene tank and route the emissions from this tank and the other two existing asphaltene tanks to an Asphaltene Tank Absorber;
7) Update all floating roof tank emissions to include the actual primary seals based on visual inspection;
8) Update the General Condition XVII and Insignificant Activities list to reflect the current operating conditions; and
9) Update the firing rate of heaters based on the vendor information and emissions based on stack test.
10) Incorporate the boiler permitted under Part 70 General Permit No. 3029-V0.
11) Update the tank inventory to achieve operational flexibility as shown in the table below TABLE A:

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Permitted emissions from the Meraux Refinery in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	217.57	206.40	- 11.17
SO_2	1736.05	684.49	- 1051.56
NO_X	1424.41	1220.06	- 204.35
CO	1823.75	1960.70	+ 136.95
VOC	1337.01	600.21	- 736.80

Timely applications for renewal of Part 70 Title V permit was submitted by the company, therefore, the facility continues to operate pursuant to 40 CFR 70.7 provided in the Part 70 Title V Program.

The facility is operating under the following permits:

Permit #	Units or Sources	Date Issued
2500-00001-V1	TV Permit for the Facility	02/08/2002
3046-V0	TV General Permit for Boiler	11/09/2006
3029-V0	TV General Permit Tanks	03/31/2006

III. *PROPOSED PERMIT / PROJECT INFORMATION*

Proposed Permits

Initial applications and Emission Inventory Questionnaires (EIQ), were submitted by Murphy Oil USA, Inc. on February 20, 2004 with further updates and addenda submitted in June, July, August and October 2005; January, March, October, November, and December2006; and a renewal application for Part 70 Operating permit in October 2005. Additional information as of March 26, 2007 was also received.

Project description

MOU is updating the "Clean Fuels" project to include the production of Ultra Low Sulfur Gasoline which allowed the construction and operation of the "No. 3 Sulfur Unit" (Phase I) and further proposes another modification to the facility to include the production of Ultra Low Sulfur Diesel (Phase II) at the facility. This project is being undertaken on the promulgated final rule titled "Control of Air Pollution from New Motor Vehicles: Heavy Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements" (Heavy Duty Engine and Highway Diesel Fuel Rule) on January 18, 2001.

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IV. *REGULATORY ANALYSIS*

The applicability of the appropriate regulations is straightforward and is provided in the Facility Specific Requirements Section of the proposed permits. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms conditions and standards are provided in the Facility Specific Requirements Section of the proposed permits.

National Emission Standards for Hazardous Air Pollutants: NESHAP From Benzene Waste Operations (BWON)

The facility generates a total annual benzene (TAB) quantity of 10 megagrams per year or greater. The facility elects to take the 6 megagrams per year option as per the requirements of 40 CFR 61.342(e) where the total uncontrolled benzene quantity for the wastes shall not be greater than 6 megagrams per year.

National Emission Standards for Hazardous Air Pollutants: NESHAP From Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units

This regulation is also known as Refinery MACT II. The facility will comply with this regulation for the new Sulfur Recovery Unit, No. 3/4 SRU. NESHAP, Subpart UUU, 40 CFR 63.1568(a)(1) states that if a unit is subject to NSPS, Subpart J, 40 CFR 60.104(a)(2) and uses an oxidation or reduction control system followed by an incinerator that unit can select to comply with the requirements of NSPS, Subpart J. the facility shall comply with the requirements of Subpart J for all the sulfur recovery units.

National Emission Standards for Hazardous Air Pollutants: NESHAP From Petroleum Refineries

The units contain tanks that receive maintenance wastewater and wastewater streams that are subject to the wastewater provisions of RMACT. When determining whether a tank must comply with the storage vessel provisions or the wastewater provisions of the RMACT, the function of the tank (whether the tank stores a waste or a product for use or reuse) is used as the basis of the determination. As defined in RMACT Subpart CC, a wastewater tank is not a storage vessel. Notably, Group 2 wastewater tanks are not subject to any control, monitoring, recordkeeping, or reporting requirements under RMACT.

National Emission Standards for Hazardous Air Pollutants: NESHAP From Petroleum Refineries

The petroleum refining process unit that contains or contacts one or more of the HAPs listed in Table 1 of Subpart CC is potentially subject to RMACT. Leaks from equipment in organic HAP service that are located in a petroleum refining process unit are subject to

RMACT. Equipment in organic HAP service in the WWTP Area is subject to the RMACT. CRLLC demonstrates compliance with this rule by complying with the provisions of 40 CFR 63.648. A process wastewater stream in a petroleum refining process unit that contains one or more of the HAPs listed in Table 1 of Subpart CC are potentially subject to RMACT. The WWTP receives process wastewater streams and, therefore, the wastewater provisions of the RMACT are applicable to the WWTP Area.

The equipment leak provisions of Subpart CC apply to all equipment that operates in organic HAP service. Equipment includes all pumps, compressors, pressure relief devices, sampling connections, open-ended valves or lines, valves, flanges and other connectors, product accumulator vessels, and control devices, or systems required by Subpart CC. However, there are no fugitive components within the WWTP Area in organic HAP service. Therefore, the WWTP Area is not subject to the equipment leak provisions of this rule.

Prevention of Significant Deterioration Applicability
The facility has netted out of Prevention of Significant Deterioration review.

Air Modeling Analysis
No modeling was required for these insignificant modifications.

Comprehensive Toxic Air Pollutant Control Program-Chapter 51
Toxic air pollutant emissions from fugitives must be controlled to a degree that constitutes MACT. The units comply with all applicable provisions of the Louisiana Air Toxics Program.

Maximum Achievable Control Technology (MACT) requirements
The Louisiana Air Toxics Program (LA MACT) requires a major source emitting any Class I or II pollutant at a rate that exceeds the minimum emission rate for that pollutant to demonstrate compliance with the Maximum Achievable Control Technology (MACT) standards. Additionally, the Louisiana Air Toxics Program requires a major source emitting any Class I, II, or III toxic air pollutant greater than the minimum emission rate for that pollutant to determine its status of compliance with the applicable ambient air standard (AAS) defined for the pollutant.

The requirements of the LA MACT apply to the storage tanks and to the units as a whole. Chalmette Refining demonstrates compliance with the LA MACT requirements by complying with the most stringent applicable federal or state air toxics regulations.

General Condition XVII Activities
The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are

not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the proposed Part 70 permits.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the proposed Part 70 permits.

V. *PERMIT SHIELDS*

A permit shield was not requested.

VI. *PERIODIC MONITORING*

The Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permits.

VII. *APPLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS*

See Proposed Permits.

VIII. *STREAMLINED REQUIREMENTS*

These proposed permits do not include any streamlined requirements.

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IX. *GLOSSARY*

Carbon Monoxide (CO) – A colorless, odorless gas which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

New Source Review (NSR) - A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$10 tons per year of any toxic air pollutant; $\geq$25 tons of total toxic air pollutants; and $\geq$100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10}- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting

program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

RMACT – Refinery Maximum Achievable Control Technology

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Title V permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.